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TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In compiling the present REVIEW, the usual data have been made use of. The most noticeable features of the month are: the movements of the low pressure-areas; the high mean temperatures in the northern, central and eastern districts; the small total rain-falls in the northeastern districts, with resulting droughts and numerous, extensive and destructive forest-fires; the grasshoppers in the northwestern States and Territories.

BAROMETRIC PRESSURE.

In general. The general distribution of the atmospheric pressure for the month is represented upon chart No. II by the isobaric curves. For Mt. Washington, the mean is 30.31 in.; and for Pike's Peak, 30.23 in. Excepting these, the highest means have been reported from Portland, Or., and the stations along the Atlantic coast, from Florida to southern New England; the lowest from Fort Gibson, 29.77, Bismarck, 29.70, Dodge City, 29.52, and North Platte, 29.47 in. The ranges in the barometers are, for Key West, .24 of an inch; San Francisco, .33; Gulf States, .30 to .43; Tennessee and the Ohio valley, .29 to .42; South Atlantic States, .41 to .47; Middle Atlantic States, .42 to .50; Upper Mississippi valley, .42 to .69; Lower Lake region, .53 to .57; Upper Lake region, .53 to .66; New England, .53 to .72; Rocky Mountain stations, .40 to .64; Lower Missouri valley, .62 to .93, and western portions of Kansas, Nebraska and Dakota, .96 to 1.24 at Bismarck.

Areas of high pressure.—Seven have crossed the northern sections of the country during the month. As the intervals between their passage were comparatively short, the periods of warm weather, caused by the movement of the low-pressure areas, were generally of short duration, excepting for the Gulf States.

No. I.—At 7:35 a. m. of the 1st, this high-pressure area extended from the Lakes to the St. Lawrence valley, with a barometric ridge running to the Western Gulf States, and was accompanied by cool, clear weather. By morning of the 2nd, the pressure had considerably increased in the northern sections, and isobar 30.30 inches included New England and New Brunswick. During the 2nd, 3rd, and 4th, it increased in the South Atlantic States, and succeeding low pressure, No. I, diminished in the northern sections, especially in the Northwest and Lake region, in advance of low pressure No. II, and continued highest over New England. In connection with low pressure No. I, brisk and occasionally high north to east winds, and heavy seas were produced along the coast from New Jersey to North Carolina on the 1st and 2nd. In lat. 37° 78' N., long. 73° 10' W. a southwest gale was experienced on the 2nd, and a northeast gale on the 3rd. On the morning of the 5th, the highest pressure, above 30.10, covered the Atlantic States, continued increasing in the Southern States during the 5th and 6th, and was central in Georgia at 7:35 a. m. of the 7th, after which it lost its distinctive features. Cautionary signals were ordered on the 1st and 2nd along the South and Middle Atlantic coasts, which were justified except at Tybee Island, Ga., Kittyhawk, Cape Henry and Norfolk.

No. II.—Following low pressure No. II, it passed over the Missouri and Upper Mississippi valleys during the 5th and 6th, but was of little interest. It moved to the Upper Lake region on the 7th. On the morning of the 8th, with No. I, an extensive area, included by isobar 30.10, reached from the Lakes to the Southern States east of the Mississippi. At 7:35 a. m. of the 10th, it covered the Atlantic States, where it continued, with increased pressure, on the 11th and 12th, and then gradually disappeared off the New England coast on the 13th and 14th.

No. III.—On the 7th and 8th it was felt at Portland, Or., reaching its maximum on the morning of the

9th. During the 9th it appeared in Montana and Dakota, in rear of low pressure No. III, and gradually extended southward, producing high northerly winds or gales and a decided fall in the temperature in Wyoming and western Nebraska, which conditions reached Kansas and the Missouri valley, with decreasing wind-velocities, on the 10th. The temperature fell from 85° to 33° at Virginia City, Montana, within sixteen hours, during the night of the 9th, and destructive frosts occurred in northeastern Utah on the morning of the 10th. At 7:35 a. m. of the 11th it extended from southern Minnesota southwestward beyond Kansas, and then rapidly lost its identity under the influence of low pressure No. IV.

No. IV.—During the 12th, while low pressure No. IV was approaching the Northwest, this area made its appearance at Fort Garry, Manitoba, and undoubtedly forced the former to take the southeastward course shown upon chart No. I. Brisk northerly winds and falling temperature prevailed from Dakota and western Minnesota to Utah and Nebraska, on the 13th. These conditions reached Kansas, the Upper Mississippi valley and the Upper Lake region during the 14th. By morning of the 15th the central highest moved from Dakota to the north of Lake Superior. On the morning of the 16th it covered the Lake region and St. Lawrence valley, but with decreased pressure, and then rapidly disappeared.

No. V—was first observed at Fort Garry, on the morning of the 19th. During the day it extended southeastward over Minnesota toward the Upper Lakes, with cool, fresh and brisk northerly winds. At 7:35 a. m. of the 20th, the highest, above 30.26 inches, was central over or north of Lake Superior, with occasional light frosts in Wisconsin and New York. On the following morning, isobar 30.20 in. included Lower Michigan, Lake Huron, Lower Lakes and the Middle States, with very cool, clear weather. Light frosts were reported from a few stations in Wisconsin, Michigan, Pennsylvania, New York, Vermont and New Hampshire; from Malone, N. Y., and near Port Huron, Mich., heavy and destructive frosts. On the summit of Mt. Washington, frostwork formed early in the morning. During the 21st and 22d, the pressure diminished, and on the morning of the 23d two areas of 30.10 in. covered the South Atlantic States and St. Lawrence valley. The latter disappeared during the 23rd and 24th, in advance of low pressure No. VII; the former extended over the Gulf States, losing its distinctive features on the 25th. Light frosts occasionally occurred in Pennsylvania, New York, Massachusetts, New Hampshire and Maine on the morning of the 22d.

No. VI.—At Portland, Or., the barometer rose to 30.39 inches at the 4:35 p. m. observation of the 23rd, and a rapid rise occurred at Virginia City during the day and night. During the 24th it reached the Missouri valley, with cool, clear weather and brisk to high northerly and westerly winds, diminishing in force at night. At Dodge City, N. 35, and Santa Fé, E. 34 miles were recorded. On the morning of the 25th the highest, above 30.40 inches, was central over Nebraska, and during the day the area extended over the Lake region, Ohio valley and interior of the Western Gulf States, with cool, clear weather. At 4:35 p. m. of the 26th, the barometric ridge covered the Mississippi valley. Its influence was felt in the Middle and New England States on the 26th and 27th; and in the South Atlantic States the 28th, after which it disappeared in advance of low pressure No. VIII. During its progress eastward light frosts were occasionally produced near Portland, Or., on the morning of the 24th; in Iowa and Wisconsin on the 25th; in eastern Dakota, Minnesota, Iowa, Wisconsin and Michigan on the 26th, injuring vegetation at Pembina; in Wisconsin, Illinois, Indiana and Michigan on the 27th, and in Pennsylvania on the 28th.

No. VII.—This was observed at Portland, Or., on the 28th and 29th, near which light frosts occurred. Succeeding low pressure No. VIII, it appeared in Dakota, Wyoming and Nebraska on the morning of the 31st, with brisk and high northerly winds and cool, clear or partly cloudy weather. At Fort Sully, an hourly wind-velocity of 48 miles was recorded. During the day it reached Kansas, the Upper Mississippi valley and Upper Lake region. At Cortville, Utah, frost and first skim of ice were formed. Its subsequent history belongs to September, but its movement was southeastward across the country over the south and middle Atlantic coasts, and had the effect of producing considerably cooler weather during its passage.

Areas of low pressure.—By referring to chart No. I, it will be seen that the centres of the barometric depressions, after appearing in the Upper Missouri valley, have generally taken a northeastward course into Canada, and farther to the northward than during previous Augusts. The result has been a diminution in the rain-fall in the northern, central and eastern districts. Frequently, while the main disturbances have continued almost stationary in the extreme Northwest, as well as during their progress northeastward, minor depressions have been developed and sent out to the eastward or southeastward, which have produced severe thunder-storms, while others have moved southward towards Texas, similar to the branch of No. IV, and gradually disappeared.

No. I.—Under the influence of high pressure No. I, this disturbance, described in the July Review as No. VIII, disappeared southeastward on the 1st, producing frequent thunder-storms along the South Atlantic coast and in Florida, with a high southwest wind at Punta Rasa.

No. II.—On the 2nd, falling barometer and rising temperature at Virginia City and the stations in the Upper Missouri valley, indicated the approach of this storm, and thunder-storms occurred in Dakota. At Bismarck a northeast wind-velocity of sixty-one miles per hour was recorded. During the 3rd occasional

thunder-storms were reported from Dakota, Minnesota and Wisconsin, and snow fell on Pike's Peak. On the 4th the central depression advanced southeastward into Dakota, with thunder-storms in Missouri, Kansas, Iowa, Wisconsin, Michigan, Indiana, Ohio and Tennessee, which were violent in first and last. At Burlington, Iowa, a high wind prevailed, at North Platte southeast 32, at St. Louis 32, and at Bismarck 62 miles were recorded. During the 5th it reached northern Minnesota, with thunder-storms in Dakota, Iowa, Nebraska, Kansas, Missouri, Illinois, Indiana, Michigan, Ohio, western Pennsylvania, West Virginia, Kentucky and Tennessee. They were reported as destructive at Girard, Pa., and Cleveland. On the 6th it passed northeastward into Canada, with occasional thunder-storms from Tennessee and North Carolina to Iowa and the Lakes, in northern New England and in the central Gulf States. Heavy rains fell in the Upper Mississippi valley, and hail at Vevay, Ind. At Marquette a south wind reached 30 miles. During the 7th the centre of this disturbance probably moved eastward along the parallel of 50° north, with continued thunder-storms from Virginia and Illinois northeastward to Nova Scotia and New Brunswick. A tornado occurred at Berlin, Pa., a violent and destructive hail-storm at Honesdale, Pa., and a destructive thunder-storm at Springfield, Mass. On the 8th it moved eastward beyond the Gulf of St. Lawrence, and on Mt. Washington the hourly wind-velocity reached 60 miles from the northwest. Cautionary Signals were ordered on the 4th at Duluth, and on the 5th at Milwaukee, Escanaba and Marquette. The two first were not justified.

No. III.—The approach of this storm was indicated by high winds, falling barometer and high temperatures, on the 6th and 7th, from Montana to Dakota and Nebraska. At Virginia City the temperature reached 92°, (highest ever recorded,) and 107° at Fort Sully. During the 8th the temperature reached 99° at Breckenridge, 97° at North Platte, and 103° at Bismarck, with a southeast wind of 67 miles at last, S. 30 at Marquette, and thunder-storms, occasionally accompanied by hail, in Dakota. On the 9th the central depression passed into northeastern Dakota, with severe thunder-storms from Dakota and Minnesota towards Ohio, Indiana, Illinois and Kansas. Heavy hail-storms prevailed on Pike's Peak and at Atlanta, Ga. At Bismarck, SE. 43 and NW. 53, North Platte, SE. 44, and Breckenridge, SE. 48 miles were recorded. As will be observed on chart No. I, it rapidly passed northeastward into Canada on the 10th, with a barometric trough extending southward to Texas. Thunder-storms accompanied it from Minnesota and the Upper Lakes southward to the Gulf States. The following are the highest hourly wind-velocities: Escanaba, S. 25, Milwaukee, SE. 26, Dodge City, NW. 36, and North Platte, NW. 60. Occasional thunder-storms continued on the 11th from Michigan to Kentucky, West Virginia and western Pennsylvania, and on the 12th in the Middle States, with a severe local storm at Savannah, during which the wind reached 40 miles from the NE. Cautionary Signals were ordered for Toledo and the stations along the Upper Lakes, but those for Lake Michigan alone were reported justified.

No. IV.—Following high pressure No. III, it was felt in Montana on the 10th and in Dakota on the 11th, with a high SE. wind at Breckenridge, and temperature of 96° at Fort Sully. By midnight of the 12th it had reached the southern boundary of Dakota. High southerly winds occurred in the western portions of Kansas and Nebraska, and occasional thunder-storms in Colorado and Dakota. During the 13th it developed into two distinct depressions, one moving towards Lake Superior and the other southward towards Texas. Thunder-storms accompanied them from Minnesota and Wisconsin to Nebraska, Kansas, Texas, Missouri and Illinois, with occasional high winds and gales. A secondary depression developed to the eastward, from which a gale resulted at Bellefontaine, Ohio, and a destructive water-spout in the vicinity of Lynchburg. A rain-fall of 5.25 inches was recorded at Boonsboro, Va. Thunder-storms continued on the 14th in Nebraska, Kansas and Missouri, and occasionally in South Carolina, Florida and Ohio. At Escanaba, after the wind shifted to N., with clearing weather, it reached 28 miles. During the 15th the central depression reached the mouth of the St. Lawrence, and thence apparently moved southeastward towards Nova Scotia, with thunder-storms from New York and New England northeastward. A tornado was reported to have occurred near Milton, Ohio, and a destructive wind and hail-storm between Wappenger's Falls and Poughkeepsie, N. Y. On the 16th it disappeared southeastward over and beyond Nova Scotia. Not any Cautionary Signals were ordered to be displayed during its progress eastward, and the only station at which they would have been justified is Escanaba.

No. V.—During the 16th, the pressure was considerably below the mean in Nebraska and Kansas, with a barometric trough extending towards Ohio, over which area occasional thunder-storms occurred. Hail fell at North Platte. Near Manhattan, Kan., the heavy rains caused floods. A gale was reported from Rockford, Ill., SE. 50 miles from North Platte, and S. 30 from Dodge City. At midnight of the 17th, the central depression was located in Northern Dakota. Thunder-storms, with heavy rains at places, occurred from Dakota and Minnesota to Kansas, Kentucky, Ohio, and from South Carolina to New Jersey, Pennsylvania and Virginia, and a tornado near Cape May. During the 18th, it rapidly moved eastward to Lake Huron, with continued thunder-storms from the Lower Missouri valley, to the Upper Lakes and Ohio, and in the Carolinas. High westerly winds prevailed near Cape Hatteras. On the 19th, it advanced to the St. Lawrence valley, accompanied by heavy winds at Fort Niagara, N. Y., and N. 32 miles at Escanaba. On Lake Erie near Madison, O., several water-spouts were formed, which traveled eastward. Off Cape Hatteras,

latitude 30° 40', longitude 75° 23', during a severe thunder-storm, a northwest squall occurred with the force of a gale. During the 20th, a secondary depression was developed as shown on the chart. Thunder-storms occurred from eastern New York to Nova Scotia and New Brunswick. In latitude 33° N., longitude 75° W., a cyclone was reported; 34° 50' N. 75° 50' W., heavy northeast gale. The following wind-velocities are given—Port Huron, N.E. 25, New River, N. C., E. high, Sandy Hook, N. 32, Portland and Thatcher's Island, N.W. 28, Mt. Washington, N.W. 72, and off Cape Henry a heavy easterly gale. On Mt. Washington, a NW hurricane continued on the 21st and 22d. During its passage, the only reports of very brisk and high winds at the Lake stations, came from Escanaba and Port Huron. Along the New England and New Jersey coasts, after the winds shifted to northwest, they occasionally increased to high during clear weather. Cautionary Signals were displayed for northeasterly winds along the Virginia and Carolina coasts, which were justified.

No. VI.—On the 19th, while high pressure No. V was advancing southward over the Northwest, falling barometer and warmer southerly winds prevailed in Montana and Utah, and continued on the 20th, which conditions extended eastward to Dakota, Nebraska and Colorado on the latter date. In Nebraska and Kansas, occasional thunder-storms and brisk to high southeasterly winds prevailed, with a wind-velocity of 42 miles at Bismarck; on Pike's Peak, a hail and snow storm. During the 21st, the central depression advanced southeastward into Southern Dakota, with thunder-storms in Colorado, Nebraska, Kansas and Iowa, very heavy rain at Davenport, and a destructive rain and hail-storm at Denver. At Dodge City the wind-velocity reached S. 40 miles. On the 22d, it was forced to move nearly due northward by the high pressure area which covered the Lower Lake region, Middle and South Atlantic States. On Pike's Peak a violent gale prevailed; at Dodge City, S. 39, and at North Platte, S. 46 miles were recorded. Thunder-storms occurred in Dakota, Wisconsin, Iowa and Michigan, accompanied by very heavy rains at La Crosse and Breckenridge. During the 23rd, the centre probably passed over Fort Garry into Canada, with occasional thunder-storms in Iowa, Wisconsin and Michigan. Cautionary Signals were displayed on the 22nd and 23rd at Duluth, but were not justified.

No. VII.—succeeded the previous one in Dakota during the night of the 23rd, and rapidly advanced to the north of the Upper Lake region during the 24th. Frequent thunder-storms accompanied it from Wisconsin, Iowa, Kansas and Missouri east and southward to Ohio, West Virginia, Carolinas and Tennessee. At Wheeling, W. Va., Centertown, Mo., and Nashville, they were reported as very heavy and destructive. On the 25th the central disturbance reached the St. Lawrence valley, with a barometric trough extending southwestward toward the Gulf States, and occasional thunder storms over that area. The following wind-velocities were recorded: Marquette, W. 32, Barnegat, S.W. 27, Cape May, S. 28, and Sandy Hook, N.W. 34 miles. On the 26th it passed eastward over the Gulf of St. Lawrence, followed by clearing weather in the Middle States and New England. A minor depression was left in the South Atlantic States, which produced occasional thunder-storms. Cautionary Signals were ordered along the Lakes, which were justified, excepting those along Lake Ontario; also along the Middle Atlantic coast, but were justified along the New Jersey coast alone.

No. VIII.—During the 27th and 28th, the pressure continued diminishing at the Rocky Mountain stations and in the Northwest, with occasional thunder-storms from Kansas to Dakota and Minnesota, and on the morning of the 29th it was apparently central in southeastern Dakota. During the day occasional thunder-storms occurred in Dakota, Wisconsin, Iowa, Illinois and Michigan; north of Pembina, a violent hail-storm; at Milwaukee, heavy and damaging rain-storm; in Grant county, Wis., very heavy rains, producing destructive floods. At Guttenburg, Iowa, 4.25 in. rain fell, causing damaging floods. On the 30th, thunder-storms continued in Colorado, Nebraska, Missouri, Iowa, Minnesota, Illinois, Indiana and Ohio, with a destructive gale at Logansport, Ind., and a hail and snow-storm on Pike's Peak. At midnight the central disturbance was located near Fort Garry. On the 31st, during its progress eastward, a barometric trough extended southward towards Indian Territory, in which frequent and heavy thunder-storms prevailed. The hail and snow-storm continued on Pike's Peak. A destructive hail-storm was reported from Alpena, where the wind-velocity reached N.W. 28 miles. At Sagetown, Ill., a destructive wind-storm occurred. Its movement upon the 1st and 2nd of September is shown upon the chart, but its description for those dates belongs to that month. There were no Cautionary Signals displayed along the Lakes, and the only high wind was reported from Alpena.

Local Storms.—On the 2nd, the wind shifted temporarily to N. 29, at Galveston, and to N. 44 miles at Indianola during heavy thunder-storms, while hail-stones as large as hen's eggs fell at former; 3rd, at Mobile, during a thunder-storm, the wind reached S. 30 miles; 7th, at Punta Rasa, heavy thunder-storm and wind-velocity 36 miles; 8th, Logansport, Ind., heavy rain-storm flooding streets, cellars, &c.; 9th, at Fort McKavett, Texas, heavy rain-storm during night with 3.24 inches rain-fall; 10th, violent rain-storm and high northwest wind at New River, N. C. coast; 13th, thunder and hail-storm at Spartanburg, South Carolina; 19th, tornado at Edgerton, Mo., severe storms in Platte county, Mo., St. Louis, and Atchison, Kan.; 21st, high S.E. wind during thunder-storm at Mobile; 22d, terrific N.W. squall during thunder and hail-storm, latitude 42° 28' N. longitude 58° 55' W.; 24th, severe thunder-storm at Aiken, S. C.; 25th, violent thunder-storm, during which several persons were stunned or fainted from the concussion and

proximity of one crash, at Fort Duncan, Tex., fierce thunder-storm at Pittsburgh, and heavy at Spartanburg, S. C.; 26th, hurricane experienced by a vessel in the vicinity of Bermuda; 27th, high easterly winds during thunder-storm early in the morning at Cape Hatteras and New River, N. C. coast; 28th, heavy gale 150 miles off shore from San Francisco.

TEMPERATURE OF THE AIR.

The isothermal curves upon chart No. II illustrate the general distribution of the temperature of the air for the present month. From a reference to the table in the lower left-hand corner of the same chart, it will be seen that the average is below that for many years in the Gulf States, Upper Mississippi valley, and at the Pacific coast stations; about the same in Minnesota and the lower Missouri valley; above in the remaining districts, especially in the Lake region and St. Lawrence valley. Minimum and maximum temperatures, respectively, for the month are given for the following stations, viz: Albany, 46°, 93°; Alpena, 42°, 87°; Atlantic City, 55°, 87°; Augusta, 70°, 97°; Boston, 50°, 96°; Bismarck, 42°, 105°; Breckenridge, 37°, 101°; Buffalo, 46°, 87°; Cairo, 63°, 95°; Cape Hatteras, 62°, 85°; Cape May, 57°, 87°; Cheyenne, 34°, 92°; Chicago, 54°, 92°; Cincinnati, 59°, 91°; Cleveland, 46°, 86°; Corsicana, 68°, 101°; Davenport, 53°, 90°; Denver, 44°, 100°; Detroit, 46°, 87°; Dodge City, 52°, 101°; Duluth, 45°, 89°; Eastport, 46°, 83°; Fort Gibson, 64°, 95°; Fort Sully, 48°, 107°; Indianapolis, 48°, 89°; Indianola, 71°, 99°; Jacksonville, 70°, 98°; Key West, 75°, 91°; Leavenworth, 55°, 93°; Lynchburg, 58°, 94°; Malone, 37°, 92°; Marquette, 44°, 91°; Mobile, 71°, 95°; Mt. Washington, 20°, 72°; Nashville, 60°, 95°; New London, 52°, 87°; New Orleans, 73°, 92°; New York, 55°, 90°; North Platte, 42°, 97°; Omaha, 54°, 92°; Oswego, 52°, 90°; Pembina, 36°, 94°; Pittsburgh, 49°, 97°; Pike's Peak, 23°, 58°; Philadelphia, 56°, 91°; Portland, Or., 51°, 91°; Salt Lake City, 46°, 95°; San Diego, 60°, 81°; San Francisco, 51°, 78°; Santa Fe, 45°, 89°; Shreveport, 69°, 96°; Vicksburg, 68°, 98°; Virginia City, 31°, 92°; Washington, 53°, 96°; Wilmington, 63°, 97°; Wood's Hole, 55°, 85°; Yankton, 46°, 93°; Yuma, 67°, 107°. The highest were recorded at Indianola on the 1st; Denver, 12th; Dodge City, 18th; Breckenridge and Bismarck, 8th; Fort Sully, 7th; Yuma, 6th; and the lowest at Mt. Washington, 21st; Pike's Peak, 23d; Breckenridge, 25th; Malone, 21st; Pembina, 26th; Cheyenne, 10th; and Virginia City, 9th. The maximum temperatures for Mt. Washington and Virginia City are the highest on record for those stations. During the first part of the month, at the 4:35 p. m. (Washington time) observations, the temperature frequently ranged from 100° to 114° at the stations in western Texas, along the Rio Grande river, while in Arizona the readings varied between 100° and 111°. At Ft. Dancin, Texas, 2 p. m., 2nd, the temperature reached 113°. It fell at Rockford, Iowa, from 83°, at 1 p. m., to 68°, at 2 p. m., on the 18th; at Leavenworth, from 90° to 68°, in half an hour, on 19th; at Memphis, from 92° to 79°, in fifteen minutes, on 22d; at Riley, Ill., decided fall from 24th to 25th, the mean of latter having been 18° lower than that of former, at Cresswell, Kan., fall of 40° on the 24th, and 41° on the 31st.

Ranges in Temperature.—At Key West, 16°; San Diego, 21°; San Francisco, 27°; Portland, Or., 41°; Gulf States, 19° to 33°; South Atlantic States, 23° to 34°; Indian Ter., 29° to 34°; Tennessee and the Ohio valley, 30° to 38°; Middle Atlantic coast, 30° to 43°; New England coast, 28° to 44°; interior of Middle States and New England, 42° to 55°; Lower Lake region, 35° to 44°; Upper Lake region, 38° to 47°; Upper Mississippi valley, 31° to 47°; Lower Missouri valley, 36° to 47°; Red River of the North valley, 58° to 64°; Santa Fe, 44°; Kansas and Colorado, 35° to 56°; Salt Lake City, 49°; Wyoming, Montana, and western portions of Nebraska, Minnesota and Dakota, 55° to 64° at Breckenridge.

Ice and Destructive Frosts have been reported as follows, viz: morning of the 10th at Coalville, Utah, frost injuring wheat and potato tops; 21st, near Fort Huron, Mich., frost damaging crops; 26th, at Pembina, frost injuring vegetation; 31st, at Coalville, frost and first skim of ice. July 8th, a severe frost occurred at Carson City, Nev., freezing vegetables.

PRECIPITATION.

Upon chart No. 3 is represented the distribution of the rain-fall and melted snow. The table in the lower left-hand corner of same gives the average precipitation, in the various districts, of the month for this and for many years. It will be observed that the regions in which the rain-fall has exceeded the average for years, viz., the Missouri valley, Upper Mississippi valley, Minnesota, Tennessee and the Ohio valley, generally correspond with those affected by the movements of the lower-pressure areas. The excess in the Western Gulf States, and the normal in the Eastern Gulf States, result from the heavy precipitations at Galveston and Mobile, while there was a deficiency at the majority of the stations, especially through the central portions. The large deficiencies in the Lower Lake region, Middle States, New England and St. Lawrence valley, are due to the fact that the low-pressure areas generally passed to the north of them, and only occasionally extended their influence southward, so as to produce rain in those sections. The following are some of the largest total rain-falls, viz: at Galveston, 10.19 inches; Mobile, 11.53; Goldsboro, N. C., 11.61 (?); Boonsboro, Iowa, 12.44 (?); Guttenburg, Iowa, 10.04; Richmond, Neb., 8.12; Camp Verde, A. Ter., 12.08; Anna, Ill., 9.41; near Cincinnati, 10.25, and Snowville, Va., 9 inches. Stations where not any rain fell are: San José and Campo, Cal., Fort Porter, (near Buffalo,) Fort Niagara, (at Oswego,) Toronto,

Fort Hall, Idaho Ter., Camp McDermit, Nev., Yuma and Fort Griffin, Texas. Those recording less than one-tenth (0.1) of an inch are: San Francisco, .01; Andover, Mass., .03; West Point, N. Y., .05; San Diego, Coalville, Utah, and Rio Grande, Texas, .06; Standish, Me., .07, and Carson City, Nev., .08 inches. At Caperville, Va., 4.70 inches of rain is reported to have fallen on the 29th, and at Fort McKavett, Texas, 3.24 inches during the night of the 9th and 10th.

Snow-fall.—Light snow fell at Virginia City on the morning of the 9th, on Mt. Washington early during the morning of the 23rd, and on Pike's Peak on the 3rd, 4th, 6th, 13th, 20th, 26th, 27th and 30th. Heavy snow on Pike's Peak on the 18th, 19th and 31st.

Hail.—1st, heavy on Pike's Peak; 2nd, at Dubuque, and large at Galveston; 6th, at Vevay, Ind., and heavy on Pike's Peak; 7th, at Honesdale, Penn.; 8th, at Pembina and on Pike's Peak; 9th, at Alto Vista, Va., Atlanta, Ga., and on Pike's Peak; 13th, at Spartanburg, S. C.; 15th, track three miles wide and six long, destroying fruits, vegetables, &c., between Wappinger's Falls and Poughkeepsie, N. Y.; 16th, at North Platte; 17th, Pike's Peak and Pembina; 19th, Le Roy, Kan.; 20th, Pike's Peak; 21st, Denver; 28th, violent at Kanab, Utah; 29th, between Pembina and Fort Garry, track three miles wide, and stones from one to seven inches in circumference; 30th, Pike's Peak; 31st, heavy at Alpena and on Pike's Peak.

Cloudy Days.—The number of cloudy days, as reported by the volunteer observers, ranges as follows in the various districts: New England, 0 to 7; Middle States, 0 to 11; South Atlantic States, 1 to 9; Eastern Gulf States, 3 to 9; Western Gulf States, 0 to 5; Arkansas, Tennessee and the Ohio valley, 3 to 13; Lake region, 0 to 9; Northwest, 0 to 11.

Rainy Days.—The number of days on which a greater or less quantity of rain fell averages as follows: New England, New York and northern Pennsylvania, 4; South Atlantic and southern portion of the Middle States, 12; Ohio valley, Tennessee and Eastern Gulf States, 15; Western Gulf States, Upper Lake region and western portion of Lake Erie; 11; Northwest, 12.

Droughts.—Fla.: Mayport, ground very dry, season unusually sickly. Ill.: Riley, rain needed 23d. Maine: Standish reports drought very severe, streams dry and wells low; West Waterville, driest August ever recorded. New Hampshire: Plaistow, during the month rain upon one day only; Shelburne, very severe, and water scarce; Auburn and Contoocookville, very severe, springs and wells failing. Vermont: reports from all stations show the month to have been exceedingly dry, and crops damaged in some sections. Massachusetts: Amherst, vegetation scorched; Mendon, streams and wells low. New York: Ardenia, corn, potatoes and gardens destroyed, springs and streams low; Albany, severe during almost the entire month; Brookhaven, severe; Elmira, severely felt; Essex county, no rain for weeks, country very dry, and much vegetation destroyed; Flushing, 20th to close of month; Kensico, gardens destroyed; Malone, severe, no rain for four weeks; Nichols, corn and buckwheat damaged; Pine Plains, crops of all kinds damaged; Port Jervis, very severe, most streams and ponds nearly dry, and no rain since June 30th; St. Lawrence county, very severe, farmers feeding grain to cattle to prevent starvation; Starkey, month dry, no great damage; Wappinger's Falls, long and severe, from July 31st to August 31st, and at close of month not enough water in streams to run factories. New Jersey: Freehold, very severe; Newark, month dry, fruits suffering; New Germantown, month dry, vegetation suffered very much; Vineland, ground dry at close of month. Pennsylvania: Blooming Grove, only one-tenth of an inch of rain; Erie, vegetation suffering greatly; York Sulphur Springs, a narrow region eight or ten miles long, and from five to eight in width during most part of summer almost destitute of rain, while the adjoining country on all sides enjoyed a favorable agricultural season; Tioga, streams very low, probably the driest period in 80 years. Tennessee: local droughts reported in the eastern portion. Virginia: Wytheville, from the 18th. Michigan: Litchfield, gardens injured. Texas: Corsicana, cotton crop greatly injured, and stock suffering for want of water.

Floods.—not mentioned above, near Wytheville, Va., about the 1st, sweeping away hay, fencing, &c.; 8th, at Loganport, Ind., a very heavy rain, flooding streets, cellars, &c.; 17th, at Fort Sully, heaviest rain-storm ever known, and on the opposite side of the river the water draining from a canon is reported to have moved out in a solid bank 3 feet deep and 200 feet wide; 26th, near Hay's City, Kan., a water-spout burst over Kill creek, causing destructive floods, and in the mountains east and west of Kanab, Utah, floods damaged roads and ditches; 28th, at Neillsville, Wis., heavy rain, damaging railroads; 31st, on Chalk creek, five miles from Coalville, Utah, a "cloud-burst" was reported, and a solid bank of water, between three and four feet high, came down the stream, destroying dams, &c.

RELATIVE HUMIDITY.

The average relative humidity for the month ranges, at the Atlantic coast stations, from 72 to 79 per cent.; in the interior of New York and New England, 59 to 69; in Maryland, Virginia and the South Atlantic States, 69 to 75; in the Gulf States and Tennessee, 69 to 78; in the Lake region and Ohio valley, 62 to 78; in the Upper Mississippi and Lower Missouri valleys and Minnesota, 68 to 74; on the plains of Kansas, Nebraska and Dakota, 59 to 64; at the Rocky Mountain stations, 29 to 68; and on the Pacific coast, 64 to 74. *Moist stations:* Atlantic City and Thatcher's Island, average, 79 per cent.; Mobile, 78; St. Marks, Knoxville, Pembina and Cairo, 77; Memphis, Tybee Island, Cape Hatteras, Cape May, Barnegat

and Mt. Washington, 76. *Dry stations.* Salt Lake City, averages 29 per cent.; Cheyenne, 38; Virginia City, 41; Denver, 42; Bismarek, North Platte and Malone, 59; Fort Sully and Albany, 61; Rochester, 62; Buffalo, 63; Dodge City and New York, 64.

WINDS.

Prevailing Winds.—The points of the compass from which the winds have blown most frequently during the month will be seen by examining chart No. II, the arrows flying with the wind. At Campo, Cal., the prevailing winds have been from the W.; Yuma, S.; Bismarek, NW.; Fort Sully, SE.; Smithville, N. C., SW.; Kitty Hawk, N. C., E.; Sandy Hook, SE.; Barnegat, E.; Atlantic City, NE.; Thatcher's Island, SW.

The *maximum velocities* are given in the description of the movements of the low-pressure areas. On the summit of Mt. Washington the highest velocities occurred on the 21st and 22nd, and on Pike's Peak on the 22nd.

Total Movements.—The largest total movements of the air during the month, independent of direction, have been recorded at the following stations, viz: Breckenridge, 11,323 miles; North Platte, 11,239; Fort Dodge, 11,196; Pike's Peak, 9,635; Cape May, 8,886; San Francisco, 8,790; Barnegat, 8,511; Fort Sully, 8,476; Sandy Hook, 8,140; Indianola, 7,910; Cheyenne, 7,870; Cape Lookout, 7,851. It has been impossible to obtain a continuous record on Mt. Washington. The smallest movements have occurred at Lynchburg, 1,807 miles; Savannah, 1,963; Augusta, 2,129; Louisville, 2,172; Morgantown, 2,208; Nashville, 2,279; Vicksburg, 2,302; Shreveport, 2,701; Memphis, 2,769; Springfield, 2,790; Savannah, 2,855; New London, 2,985; Cincinnati, 2,898.

VERIFICATIONS.

Probabilities.—As worked up three times daily and issued to the public, they have been carefully compared with the actual conditions during the succeeding twenty-four hours, and the following result obtained. The percentage of verifications has averaged 86.13 for New England, 86.83 for the Middle States, 88.23 for the South Atlantic States, 87.68 for the Eastern Gulf States, 88.91 for the Western Gulf States, 86.52 for Tennessee and the Ohio valley, 88.60 for the Lower Lake region, 90.20 for the Upper Lake region, 86.99 for the Upper Mississippi valley, and 82.44 for the Lower Missouri valley. The average for the whole country is 87.25 per cent. For the weather, 85.88; wind direction, 92.33; temperature, 88.62; barometric changes, 82.20 per cent. have been obtained. There were four omissions to predict out of 3,720, or 0.1 per cent.

Cautionary Signals.—During the month fifty-two (52) signals were ordered to be displayed at the different stations along the South Atlantic and Middle Atlantic coasts, and the Lakes. Of these, one (1) was ordered late, thirty-four (34) have been reported as justified, and seventeen (17) not justified. Warnings were sent for two Canadian stations, along Lake Huron, on the 10th, but are believed to have been not justified. Thirty-four (34) cases have been reported, from scattered stations, where the wind-velocity reached twenty-five (25) miles, and over, per hour without the display of Signals, viz.—on the 1st, Cape Henry, N. E., 36 miles; Kittyhawk, E., 28; Cape Hatteras, S., 34; 2nd, Galveston, N. W., 29; Indianola, N., 44; 3rd, Mobile, S., 30; 6th, Key West, E., 25; 7th, St. Marks, S. W., 26, (squall); 8th, Marquette, S., 30; 10th, Key West, E., 30; Cape Lookout, N. W., 26; 12th, Savannah, E., 40; 13th, Indianola, S., 27; 14th, Escanaba, N., 28; 18th, Cape Lookout, W., 30; 19th, Escanaba, N., 32; 20th, Sandy Hook, N., 32; Boston, N. W., 32; Thatcher's Island, N. W., 28; Portland, Me., N. W., 28; Port Huron, N. E., 25; 21st, Mobile, S. E., 29; Cape Lookout, N. E., 28; Cape Hatteras, N. E., 26; 22d, Boston, W., 26; 24th, Mobile, S. E., 28; 26th, Buffalo, W., 26; Alpena, NW., 28; 27th, Kittyhawk and Cape Hatteras, NE., 28; Cape May, N., 32; Sandy Hook, N. W., 29; Portland, Me., N. W., 26; 31st, Alpena, N. W., 28. In a great many cases they occurred during local thunder-storms, and were of short duration.

NAVIGATION.

Height of Rivers.—Upon chart No. III is printed a table giving the highest and lowest marks, with the dates upon which they occurred. In the Red river there has been a steady decline at Shreveport during the month, excepting a temporary rise of thirty inches on the 11th. The Missouri fell slowly at Fort Sully up to the middle of the month; after a sudden rise of one foot, it continued slowly falling till the 27th, then rose to its maximum on the 29th. At Yankton and Omaha it changed but slightly until reaching its maximum, after which the fall was quite regular until the minimum was reached, when a rise of a few inches closed the month. At Leavenworth it fell quite regularly up to the 20th; after a rise of one foot on the 21st, its decline was steady. The upper Mississippi continued quite low throughout the month. At Keokuk navigation was greatly impeded. At St. Louis, after falling steadily and reaching its minimum, it rose to 14 feet 4 inches on the 27th, and then continued slowly falling. The lower Mississippi fell quite steadily throughout the month, excepting slight rises at Cairo on the 13th and 24th, and at Memphis on the 17th and 26th. An immense sand-bar formed during the first week at the lower side of the "cut-off" below

Vicksburg, and De Soto, La., extending from the right bank of the river in a southeasterly direction. At Nashville the Cumberland fell from the 1st to the 3rd, rose to the 6th, fell five feet to the 12th, rose five feet on the 13th, slowly fell eight feet to the 25th, and rose one foot the 26th, after which its decline was regular. The changes in the Ohio were of slight importance, except at Cincinnati, when a rise of over eleven feet occurred between the 15th and 18th. At Pittsburgh navigation was nearly suspended the 11th, and the Alleghany said to be lower on the 14th than for many years. At Augusta, the Savannah river reach its highest point, 16 feet 6 inches, on the 1st, from which there was almost a steady decline until it reached its minimum, 5 feet 8 inches, on the 30th. At Trenton, N. J., the Delaware river was one inch lower on the 27th than it had been during the past fifty-four years. On 30th, river extremely low at Breckenridge. Connecticut river very low on 31st at Westminster, Vt. Delaware and Lackawanna rivers 14 inches below lowest recorded low-water mark, 1836, in vicinity of Honesdale, Penn.

TEMPERATURE OF WATER.

As heretofore, the maximum and minimum temperatures alone, with the average depth of the water, are given in the table on the lower right-hand corner of chart No. II. The least range of 3° was recorded at Eastport and St. Marks, and the greatest of 24° at Burlington, Vt.

ATMOSPHERIC ELECTRICITY.

A peculiar electrical display was observed on Pike's Peak, during the evening of the 18th. It was attended by a strange singing or rather sizzling on the wire, which was distinctly illuminated for an eighth of a mile, the electricity being thrown off in brilliant scintillations. Every metallic point and surface were also tipped or covered with light, the entire atmosphere having been apparently highly charged with electricity. Snow was falling at the time, and the air was very humid. At Omaha, during the afternoon of the 16th, communication by telegraph was interrupted by the electricity on the wires, and the electrical fire-alarms were repeatedly sounded.

Thunder Storms.—The sections in which they have occurred have been very generally mentioned in giving the details, under the head of low pressure areas. The dates, states, and number of stations in each state when more than one are: 1st, Fla. 3, Neb., Tenn., S. C., Ga. 2, and Col. 2; 2nd, Tenn. 2, Dak. 2, Texas, 2, Ala. and Fla.; 3rd, Dak., Ga. 3, Wis., Ala., Tenn. and Minn.; 4th, Ala. 2, Kan., S. C., Ga. 2, Ind., Iowa 3, Kan. 3, Mich. 3, Ohio 2, Tenn. 2, Wis. 5, and Fla.; 5th, Dak., Minn. 3, Ill., Iowa, 5, Kan. 3, Mo., Neb. 4, Ohio 4, Tenn., Mich., W. Va., Ind., N. Y., Ala., Penn., Ky. and Ga.; 6th, Ill. 3, La., Me., Mich., N. Y. 2, Ohio, Penn., Tenn., Vt., Va., Ala., N. C., Iowa, Fla. and Ga.; 7th, Ark., Conn., Fla. 2, Ill., Ind. 2, Me., Mass. 5, N. Y. 3, Ohio 3, Penn., Vt., Va., W. Va., S. C., Ala., Texas and Ga.; 8th, Ala., Ill., Tenn. 3, Va. 2, Ind. 2, Ohio, Md., Fla., Dak. and Ind. Terr.; 9th, Ala. 2, Ill. 3, Minn., Ohio 2, S. C. 2, Tenn., Va., Wis., Dak., Miss., N. C. 2, Fla., Ind. 2, Texas, Kan. and Md.; 10th, Ga., Ill., Iowa 2, La., Mich., N. C. 2, Ohio 3, Tenn. 2, Wis., Va. 2, Ind. 2, Ala., Md. 2, and Dak.; 11th, Iowa, Ky., Mich. 2, Ohio 2, Penn., S. C., Miss. and W. Va.; 12th, Conn. 2, Ind., Kan., Mass., S. C., Ala., Cal., Md., Texas, Dak. and Penn.; 13th, Ill. 2, Fla. 2, Ga. 2, Iowa 2, Minn., Mass., Mo., Neb. 3, Penn., S. C. 2, Texas 2, W. Va., Md., Kan. and Wis.; 14th, Kan. 2, Fla. 2, Mo. 2, Neb., Ohio, S. C. 2, and Ala.; 15th, N. Y., Conn., Ill., Kan., Me. 5, Mass. 5, Ohio, Tenn., Fla., Ala. 2, Miss. and N. C.; 16th, Ill. 2, Iowa 4, Kan., Neb. 3, Ind., Ohio, Ala., Ky. and Fla.; 17th, Ill. 2, Ky. 2, Minn., Neb. 3, Ohio 2, Va. 2, S. C., Penn. 2, Kan., N. J. 2, Iowa 2, W. Va., Fla. and Dak. 3; 18th, Minn., Ill. 2, Ind. 2, Iowa, Kan., Mich., Ohio 2, S. C., Wis., Ala., N. C. 3, Neb. and Dak.; 19th, Kan. 4, Mich., Mo., Neb., N. Y. 3, S. C. and Ala.; 20th, Neb. 3, Kan. 2, La., Wis., N. H., N. Y., S. C., Tenn., Vt. 2, Me., and Ala. 2; 21st, Iowa, Neb. 3, Fla., Cal., Ala. and Kan.; 22d, Dak., Minn. 2, Iowa 2, Mich. 2, Wis. 2, Ala. and Fla.; 23d, S. C., Iowa 2, Wis. and Mich. 2; 24th, N. C., Ga., Ill. 2, Iowa 4, Kan., Mo. 2, Ohio 5, Tenn. 3, Wis. 5, S. C., Ind., Ala., W. Va. and Mich.; 25th, Penn. 2, N. Y., Ga., La., Me., Mass. 2, N. C. 2, Tenn., Vt. 2, S. C., Tex. 2, Miss., W. Va. and Ala.; 26th, N. C. 2, S. C. 2, Me. 3, Mass., Penn. 2, Vt., Mo., Tex. and Ga.; 27th, Fla. 2, Ga. 2, Penn., N. C., Dak., Ala. and Tex.; 28th, Iowa 2, Kan., La. 2, Neb., Minn., Ga., Fla. and Miss.; 29th, Ala. 2, Ill. 2, Iowa 4, La., Wis. 2, Dak., Mich. and Fla.; 30th, Ill. 3, Ind. 4, Iowa 3, Mass., Mo. 2, Neb. 2, Nev., Ohio 2, Minn. and Cal.; 31st, Ill. 5, Iowa 2, Kan. 3, Mich., Neb. 2, Nev., Ohio 2, S. C. 2, Tenn. 3, N. C., Ky. and Fla.

Auroras.—That of the 25th was most extensively observed. Displays were reported as having been seen on the 1st at Buffalo; 3d, Mt. Auburn, Ohio; 10th, Cornish, Me.; 11th, Vevay, Ind., Gardiner, Me., and Duluth; 12th, Embarrass and Le Roy, Wis., and Escanaba; 13th and 14th, Pembina; 15th, Auburn, N. H., and Pembina; 16th, Le Roy, Wis., and Pembina; 17th, Pembina; 18th, Eastport; 19th, Pembina; 20th, Marquette; 21st, Washington; 24th, Duluth; 26th, Ft. Stevenson, D. T., Cresco and Ames, Iowa, Duluth, St. Paul and Utica, Wis., Escanaba, Alpena, Port Huron, Erie, Buffalo, and Gardiner, Me.; 28th, Gardiner, Me., and Duluth; 29th, Gardiner, Me.

OPTICAL PHENOMENA.

Solar Halos.—1st, Iowa, Tenn.; 3rd, Ga., Ind. Ty.; 4th, N. C.; 5th, Miss., Ohio; 6th and 7th, S. C.; 8th,

Miss.; Ohio; 9th, Ohio; 10th, N. C.; 11th, W. Va.; 12th, Ill., Ga., Iowa, Ala.; 14th, N. J., Ga.; 15th, Mich., La.; 16th, Kan.; 17th, Ill., Pa.; 18th, N. Y., Ill.; 19th, Ind., S. C., Kan., Me.; 20th, Fla.; 22nd, N. J., N. Y.; 23d, Ky.; Ohio; 24th and 25th, Me.; 26th, Ill., Wis., Ga.; 27th, Ga., Mich., Wis.; 28th, Ill., Wis., Mich., N. M.; 29th, Ohio, Mich.; 30th, Ill., Mich., Ohio, Ga.; 31st, N. J., La.

Lunar Halos.—1st, Iowa, Mass., N. Y., Minn.; 2nd, Conn., Ala.; 3d, N. C., Mass.; 4th, Minn., N. C.; 5th, Tenn., Penn., N. C., N. Y., Dak.; 6th, N. Y., Me., Ala., Minn., La., Fla.; 7th, Mich., S. C., N. Y., Ohio, N. C.; 8th and 9th, Ohio, N. C., Fla.; 10th, Mich., Fla.; 11th, N. C., Fla.; 12th, D. C.; 18th and 23d, Ky.; 24th, Md., Penn., Va.; 25th, Me., Ga., N. M.; 27th, N. C., Fla.; 28th, N. C., Mo., Ga.; 29th, Ind., N. Y., Ohio, Ga., N. C., Mo., Me.; 30th, Iowa, Me., Ohio, Minn., Ga., N. C., Mich.; 31st, Ind., Ohio, Penn., Iowa.

Mirage.—4th, Dodge City; 5th, Dodge City, Breckenridge; 11th, Breckenridge; 13th, New London, Revere Beach, Mass.; 21st, New London; 23rd, Breckenridge; 26th, Moorhead, Minn.; 27th, Breckenridge.

Meteors.—1st, Wooster, O., Buffalo; 2nd, Vevay, Ind.; 3rd, Lyndon, Ill., Smithville, Davenport; 4th, Carbondale, Ill., Ellinwood, Kan., Trenton, N. J.; 6th, Nottaway C. H., Va., Davenport; 7th, Freehold, N. J., Hanover, Pa., Davenport; 8th, Ellinwood, Kan., Woodstock, Md., Fall River, Mass., Richmond, Neb., Freehold, N. J., Wautoma, Wis., Dubuque, Malone, Davenport; 9th, Lyndon, Ill., New Harmony, Ind., (brilliant), Vevay, Ind., Woodstock, Md., Fall River, Mass., Corning and Frankford, Mo., Waterburgh, N. Volney and Flushing, N. Y., Duluth, Smithville, Morgantown, Detroit, Davenport; 10th, Lyndon, Ill., New Harmony, Ind., Vevay, Ind., Ellinwood, Kan., Woodstock, Md., Fall River, Mass., Richmond, Neb., Carson City, Nev., Trenton, N. J., Waterburgh, N. Y., Mt. Auburn, O., Dubuque, Dodge City, Morgantown, Malone; 11th, Lyndon, Ill., Vevay, Ind., at Muscatine, Iowa, (10 to 10.45 p. m. 50 meteors observed); Ellinwood, Kan., Corning and Oregon, Mo., Richmond, Neb., Carson City, Nev., Trenton, N. J., Waterburgh, N. Y., Cincinnati, Dodge City; 12th, Lyndon, Ill., Monticello, Iowa, Ellinwood, Kan., Richmond, Neb., Carthage and Mt. Auburn, Ohio, Smithville, Dodge City, Malone, Davenport, (many); 13th, Lyndon, Ill., Waterburgh, N. Y., Nashville, Malone, Davenport, (numerous), Indianola; 14th, Lyndon, Ill., Vevay, Ind., Ellinwood, Kan.; 15th, Ellinwood, Kan., Waterburgh, N. Y., Jacksonsburg, Ohio, Hampton, Va., (numerous); 16th, Lyndon, Ill., Ellinwood, Kan., Woodstock, Md., Auburn, N. H., Wooster, Ohio, Smithville; 17th, New Harmony, Ind., (brilliant), Ellinwood, Kan., Woodstock, Md., Waterburgh, N. Y., Davenport, Fort Gibson; 18th, Lyndon, Ill., Corning, Mo., (large, seen at 2 p. m. with sun shining brightly), Vineland, N. J.; 19th, Wooster, Ohio; 20th, New Harmony, Ind., Ephrata, Pa., Savannah, St. Paul; 21st, Ellinwood, Kan., Woodstock, Md., Corning, Mo., N. Volney, N. Y., Wooster, Ohio; 22nd, Salem, W. Va., Davenport; 23rd, Lyndon, Ill., Vineland, N. J., Smithville, Malone; 24th, Atlanta, Ga.; 25th, Harbor Grace, N. F., San Francisco; 26th, Ellinwood, Kan.; 27th, Hanover, Pa., St. Paul; 28th, Waterburgh, N. Y.; 29th, Lyndon, Ill., (very brilliant W. to E.), Ephrata, Pa.; 31st, New Orleans, La., (brilliant).

Polar Bands.—1st, Hanover, Pa.; 2nd, Newport; 10th, Breckenridge; 11th, Auburn, N. H., Hanover, Pa.; Freehold, N. J.; 19th, Milwaukee; 20th, Detroit; 22nd, Benettsville, Ky., Norfolk; 24th, Hanover, Pa.; 31st, Duluth.

Earthquakes.—August 16th, 1:15 p. m., bark "Forest Queen" experienced a heavy earthquake shock of fifteen seconds duration, in latitude $41^{\circ} 55' N.$, longitude $126^{\circ} 25' W.$; 16th, 11:25 p. m., shock seven seconds duration, accompanied by a loud rolling noise for twenty seconds, vibration from NW. to SE., at Lower Brule Indian Agency, D. T.

Icebergs.—August 3rd, in latitude $42^{\circ} 59' N.$, longitude $49^{\circ} 57' W.$; 11th, in latitude $43^{\circ} N.$, longitude $51^{\circ} W.$; 12th, in latitude $48^{\circ} 50' N.$, longitude $49^{\circ} 58' W.$; 18th, in latitude $47^{\circ} 15' N.$, longitude $47^{\circ} 30' W.$, six large ones; 19th, between twenty and thirty large bergs, in latitude $47^{\circ} 45' N.$, longitude $48^{\circ} 05' W.$, largest from 100 to 200 feet high, drifting in a SW. direction; steamer Arbitrator, from New Orleans, 12th, for Liverpool, struck an iceberg, and sunk in thirty minutes on 23d.

MISCELLANEOUS PHENOMENA.

Zoological.—*Swans*, at Keokuk, flying S. 25th and 31st. *Wild Pigeons*, at Pembina, flying SW. 15th and 17th, NW. 25th, N. 27th and 28th. *Wild Geese*, at Wautoma, Wis., flying SE. 13th; Breckenridge, S. 24th; Fort Sully, S. 30th; Pembina, N. 14th and SE. 31st. *Wild Ducks*, at Barnegat, flying S. 20th. *Swallows* last seen at Cornish, Me., 18th; Breckenridge, Minn., 24th; West Charlotte, Vt., 28th. *Bobolinks* last seen at Cornish, Me., 21st; West Charlotte, Vt., 28th. *Night Hawk* last seen at Cornish, Me., 22nd. *Cuckoo* and *Whip-poor-will* last heard at Contocookville, N. H., 16th and 17th respectively. *Robins*, large flocks flying W. at Shreveport, La., 26th. *Colorado Beetle*, numerous at Mendon, Mass., 4th; appeared on the 1st at Strafford, Vt., but not much damage done; potato crop nearly destroyed by bugs at Albany, N. Y. *Grasshoppers*—Missouri: 6th, appeared at La Mars, Nodaway county. Iowa: 6th, appeared at Storm Lake, Cherokee and Sioux City, column extending to lower Dakota and La Mars, Mo., at Fonda, Pochahontas county, damage slight; 25th, at Unionville, Appanoose county, flying in large clouds at a high elevation, and Des Moines, Polk county, flying towards the Missouri in immense numbers,

"none have yet alighted in central Iowa." Minnesota: Breckenridge, swarms seen on 1st, very destructive 3rd, flying and depositing eggs 6th to 12th; a small red bug, said to be devouring eggs, appeared, but the observer could not ascertain this to be a fact from careful observation; in the western counties, wheat, corn, oats and barley have suffered severely. Kansas: 22nd to 31st, Dodge City, numerous and very destructive, causing entire loss of crops in many sections; 24th, Ellinwood, came from N. and NE., 29th, SW., 31st, NE. and W.; Fort Wallace, flying SW. 19th, N. 23rd, settling 24th; 31st, Atlanta, came in large numbers, injured fall wheat, late corn and gardens, also flying SE. Nebraska: 5th, at North Platte, Lincoln county, entire corn crop destroyed, and in Dawson county one fourth of crop destroyed; came from Dawson county to Buffalo county; 10th, Clear Creek, flying SW., 11th, NW.; arrived in immense numbers 18th, and remained rest of month; 11th, alighted in immense numbers at Fremont, Dodge county, and commenced on the corn, country near Elm Creek, Buffalo county, cleaned out, column moving in a NW. direction, not many miles wide; 12th, very thick at Columbus, Platte county, came down the valley from North Platte, doing but little damage; at Grand Island, Hall county, loss small; 13th to 26th, at Omaha, numerous at times, flying in all directions; 18th to 31st, at De Soto; 23rd, at Lincoln, Lancaster county, in vast numbers, but not so numerous as in 1874, passing S. and SE. in clouds, corn considerably damaged; 24th to 31st, at Plattsmouth; 25th, in York county, have left nothing but harvested grain. Dakota: 6th, appeared in the extreme southeastern part of the State; 10th to 29th, at Fort Sully, numerous, decreased during 30th and 31st; at Yankton, numerous during early part of month, destroying all the corn, about 10th began to depart, and all gone in a few days; 26th, Bismarck, swarms flying SW. Colorado: 2nd, Denver, came from N. in great numbers, very destructive, 3rd, continued numerous until 11th, had all left by 13th, from 22nd to 28th, flying in air, but few alighting, diminished in number 29th to 31st; 3rd, passed over Pueblo, going north, no damage; 5th, Golden, flying SE. about 6th to 13th, leaving 13th to 16th, returning from NW. 23rd, and flying NW. 24th and 25th; 12th, near Denver, made a clean sweep of the mountain ranches, came in dense, thick clouds, but have mostly moved away; 31st, Fort Garland, air filled, flying with the wind. Wyoming: at Cheyenne, abundant from the 7th to 31st. Montana: millions flying SE. 1st to 5th, at Virginia City, decreased in numbers until 29th, no eggs deposited.

Forest fires.—5th, in New Brunswick; 8th to 12th, Carson City, Nev.; 16th, on Campobello Island, N. B.; 17th and 18th, Shelburne, N. H.; 22nd to 31st, Auburn, N. H.; 24th to 31st, Blooming Grove, Pa.; 25th, North Hammond, N. Y.; 27th to 31st, Fishkill Mountains, N. Y.; 28th, in the mountains near Pond Eddy, Pa., vast amount of timber destroyed; around Honesdale, Pa., woods burning fiercely; in Clinton township, Alleghany county, Pa., men fighting the fire; the Moosic Mountains, Luzerne county, Pa., ablaze for miles, a vast amount of timber destroyed, but one rain in this section since July 4th; in the mountains, Essex county, N. Y.; in the Highlands, opposite Newburg, and near West Point, immense surface burned over; 31st, Mt. Desert, Me., raging in woods; Pike's county, Pa., raging with great violence, valuable timber destroyed; St. Lawrence county, N. Y., large quantities of timber, hay and grain destroyed, and some cattle burned; near Boonton, N. J., several thousand acres of bog meadows on fire, for a number of days; near North Conway, N. H., large quantities of valuable timber destroyed in mountains.

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